

bus, thorace medio plaga magna nigra nitida: capite (cum oculis) quam thorax utroque sexu vix latiore, inter antennis depresso; thorace antice paullo angustiore, disco quinquetuberculato; elytris elongato-oblongis, convexis, ante apicem paullo subito declivibus, apice subtruncato-truncatis, dorso punctulatis, carina laterali recta acuta, longe ante apicem terminata, carinula accessoria carinæ parallela, minus elevata sed longius prolongata; antennis nigris, scapo subtus et apud apicem rufo, articulo quarto albo; pedibus nigris, femoribus vel totis vel subtus tantum flavis.

Long. $7\frac{1}{2}$ lin. ♂ ♀.

Ecuador (*Buckley*).

Amphionycha rubra.

Oblongo-cylindrica, postice angustata, rufa, antennis nigris: capite (♂) magno, exserto, infra retracto, inter antennis depresso, vertice valde convexo, fronte elongata, planata, oculis parvis; thorace breviter cylindrico; elytris apice late truncatis, angulo exteriore paullulum producto, medio dorso planato, apice declivi, carina laterali subrecta, abbreviata, carina accessoria flexuosa, longiore.

Long. 6 lin. ♀.

Novo Friburgo, Rio Janeiro, Brazil.

Amphionycha urocosmia.

Gracilis, flavo-testacea, subnuda, metathorace (medio), abdomine elytrisque dimidio apicali nigris, his plaga magna subapicali canotomentosa; antennis (♀) corpore longioribus, cinereo-nigris, articulo quarto flavo; capite exserto, inter antennis planato, fronte convexa, lateribus paullo rotundatis; thorace cylindrico, basi constricto; elytris apice subsinuatim truncatis, angulis productis, dorso sublineatim punctulatis, epipleuris nitidis, carinis duabus æqualiter acutis.

Long. $4\frac{1}{2}$ lin. ♀.

New Granada.

[To be continued.]

XXI.—*On a Collection of Crustacea made by Baron Hermann Maltzam at Goree Island, Senegambia.* By EDWARD J. MIERS, F.L.S., F.Z.S.

[Plates XIII., XIV., XV., & XVI.]

THE collection that forms the subject of the present Report, which will be continued in the two succeeding numbers of the 'Annals,' is of very considerable interest, as having been made in a locality hitherto scarcely visited by the carcino-

logical collector, and also on account of the number of new and remarkable forms it contains.

All the species collected, except *Penæus brasiliensis*, were dredged in Goree Bay, at a depth of about 9-15 fathoms (18-28 metres), on a bottom partly shelly and partly muddy, and were brought to the British Museum by Baron Hermann-Maltzam. Dr. Günther, Keeper of the Zoological Department, recognizing the scientific value of this collection, intrusted it to me for description; and a complete set of the species obtained has been retained for the British Museum.

Although (so far as I am aware) the only species heretofore described from Goree is the *Pilumnus africanus* of M. Alph. Milne-Edwards, a considerable number of species have been recorded from other localities on the West-African coast, and from the Cape-Verd and Canary Islands and Madeira, by Leach, Webb and Berthelot, Dana, Stimpson, Milne-Edwards, and other naturalists, reference to whose works will be found in the following pages; and a very close affinity will be shown to exist between the crustacean fauna of West Africa and that of the Mediterranean region, through the island groups above mentioned. In the determination of this affinity I have been much aided by the collections made at Madeira by the Rev. R. B. Watson and at the Canaries by the late R. MacAndrew, Esq., and by them presented to the British Museum.

A very distinct but less marked relationship is also traceable between the West-African Crustacea and those inhabiting the western shores of the Atlantic (particularly the West Indies); and some few of the species collected have even an Oriental distribution. One only has as yet been recorded from the Cape of Good Hope (*Pilumnus verrucosipes*, Stimpson).

At the end of the paper will be given a systematic list of the genera and species, with the geographical distribution as far as known at present.

I have added descriptions in footnotes of a few species from neighbouring localities in the British-Museum collection.

Baron Hermann-Maltzam is himself engaged in working out the interesting series of Mollusca collected; but the few shells inhabited by Paguridæ and referred to below have been determined for me by my colleague Mr. E. A. Smith,

DECAPODA.

BRACHYURA.

Stenorhynchus rostratus (Linn.).

Several small specimens, both males and females, are in the collection; the length of the cephalothorax of the largest to tip of rostrum is only about 7 lines (15 millim.).

In all of these specimens the rostrum is very short, the epistome and basal antennal joint are without spines, and the anterior legs nearly smooth; the long vertical spines on the gastric and cardiac regions of the carapace are in most of these specimens more developed than in the numerous European specimens of *S. rostratus* in the collection of the British Museum.

An adult male in the collection—length of carapace about $8\frac{1}{2}$ lines (18 millim.)—differs from the foregoing and from typical specimens of *S. rostratus* in having the anterior legs or chelipedes armed with numerous spinules on the upper and lower edges of the arms, wrists, and hands, which joints are ordinarily in *S. rostratus* smooth or simply granulated; the fingers, which are dilated and laterally compressed, are smooth, and when closed have between them, near the base, a wide hiatus. A specimen collected by W. S. Kent, Esq., during the 'Norma' Expedition, in Vigo Bay (which, however, has the rostrum broken), and one from Belfast Bay, dredged in 20 fathoms (*W. Thompson, Esq.*), present similar characters.

This variety differs from *S. aegyptius*, *S. Czernjawsckii*, and *S. longirostris* in the very short rostrum and by the absence of the minute spines at the base of and upon the basal antennal joint, and may be designated var. *spinulosus*.

Herbstia violacea.

Micropisa violacea, A. M.-Edwards, Nouv. Archiv. Mus. Hist. Nat. iv. p. 50, pl. xvi. figs. 3-6 (1868).

To this species I refer a series of small specimens (both males and females). Length of the largest about 9 lines (19 millim.), breadth about 7 lines (nearly 15 millim.).

The spines of the carapace show great variation in the degree of their development. In all the specimens I have examined the chelipedes have the inner margins of the fingers smooth, not denticulated. Specimens are in the British Museum (preserved dry) from the West-African coast,

Pisa carinimana.

Pisa carinimana, Miers, Ann. & Mag. Nat. Hist. (ser. 5) iv. p. 11, pl. iv. fig. 6 (1879).

Several specimens are in the collection, of both sexes and different sizes; none are as large as the type from the Canaries (*R. MacAndrew, Esq.*), which (rostrum included) measures 7 lines in length (15 millim.); the largest specimen in the Senegambian collection has a total length (rostrum included) of only 6 lines (13 millim.), breadth little over 4 lines (9 millim.).

Some of the specimens preserved in spirit are of a beautiful rose-colour with yellowish patches, others yellowish brown; but there are apparently no other differences observable between the two varieties. Only in adult males are the specific characters drawn from the anterior legs or chelipedes to be made out. In the females not only are these characters undistinguishable, but also the tubercles on the gastric and branchial regions are commonly obsolete; the transverse tubercles of the gastric region (which are very obscure in the type) are not to be made out in the series now before me, and ought to be erased from the specific description.

Lambrus (Parthenopoides) massena, Roux.

A good series of specimens of both sexes is in the collection, which I refer here. Colour in spirit varies from yellowish brown to reddish.

This species varies very considerably in the form of the rostrum and the amount of tuberculation of the carapace; and it is possible that some of these differences may be of specific importance.

In what I shall regard as the typical, because the commonest, condition of the species, with which I believe *L. rugosus*, Stimpson, from the Cape-Verds, to be probably identical, the front is very prominent, triangulate, and acute or subacute; the gastric, cardiac, and branchial regions very convex and tuberculated; one tubercle on the summit of each of these regions is more prominent than the rest; the inter-regional depressions in the carapace and the sides towards the lateral margins of the branchial regions are nearly smooth. The chelipedes have the merus or arm rather slender and elongated, strongly tuberculated above, palm with but few granules or tubercles on its flattened upper surface (exclusive of the marginal teeth).

Length and breadth of a specimen from Goree a little over

7 lines (15 millim.) ; length of the larger (right) chelipede when fully extended 1 inch $2\frac{1}{2}$ lines (31 millim.).

There are in the Museum collection examples from the Mediterranean and Sicily.

In two specimens, length and breadth of largest about $7\frac{1}{2}$ lines (16 millim.), which otherwise do not differ much from the foregoing, the prominent tubercles of the gastric, cardiac, and branchial regions are developed into blunt spines, a similar spine exists near the distal end of the upper surface of the arm, and the upper surface of the palms is strongly granulated and tuberculated ; they may be designated var. *spinifer*.

In another set of specimens from Goree Island, which appear entitled to rank as a distinct variety, the front is much less prominent, more deflexed and rounded at its distal end, the regions of the carapace less convex and less prominently granulated, with the interspaces and the sides towards the lateral margins also more or less granulated ; arm generally shorter. They may be designated var. *atlanticus*.

The five specimens I have seen are females. Colour in spirit more or less reddish ; length of the largest a little over 7 lines (15 millim.) ; breadth 8 lines (over 17 millim.). Length of larger chelipede when extended about 1 inch 1 line (nearly 28 millim.).

Another adult female differs from any of the preceding in having the carapace almost altogether destitute of tubercles or spines ; some very small and obscure granulations exist on the branchial and cardiac regions and on the interspaces between them and on the posterior margin ; the upper surface of the hands is nearly smooth. In the less acute rostrum and in general form this specimen nearly resembles the preceding variety, of which it is probably an extreme condition. The colour is a nearly uniform deep red. Length of carapace about $6\frac{1}{2}$ lines (14 millim.) ; breadth about 7 lines (15 millim.). Length of larger chelipede when fully extended about 1 inch ($25\frac{1}{2}$ millim.).

L. pulchellus, A. M.-Edwards*, from the Cape-Verd Islands, has the front in the figure represented as truncated, concave on each side in front of the orbits, and may be distinct from any of the foregoing.

Lambrus (Parthenopoides) bicarinatus, sp. n.

In this, which I must regard as a distinct species, because I have observed no examples connecting it with any of the

* Nouv. Arch. Mus. Hist. Nat. iv. p. 53, pl. xvi. figs. 7-9 (1868).

varieties above enumerated of *L. massena*, the carapace is more depressed than in that species, and the front elongated triangulate acute or subacute, and scarcely at all deflexed. There are a few small granules on the summit of the gastric, cardiac, and branchial regions, and in the interspaces between the two last mentioned, and on the posterior margin; but the anterior part of the carapace, rostrum, and the sides of the branchial regions are smooth; the branchial regions are obliquely carinated, the carina reaching to and most distinctly defined near the postero-lateral margins. The chelipedes have the arms distinctly tuberculated; palms smooth on the upper surface. Colour (in spirit) yellowish brown or pinkish. Length and breadth of the largest example about 6 lines ($12\frac{1}{2}$ millim.).

Four specimens (males and females) are in the collection from Goree. There is also in the British Museum a male from the Canaries.

This well-marked form may be distinguished from *P. expansus*, Miers, by not having the carapace nearly so much produced over the bases of the ambulatory legs, the acute rostrum, and other points.

It bears some resemblance to the variety figured by Costa * of the form he designates *Parthenope contracta*; the carapace, however, is broader, not indented on the sides of the hepatic regions, and there is no prominent spine on the cardiac region. The typical *P. contracta* is regarded by Heller and others as synonymous with *P. massena*.

Heterocrypta Maltzami, sp. n.
(Pl. XIII. fig. 1.)

In this species, of which I have seen a large number of specimens of both sexes from Goree, the carapace is pentagonal rather than triangulate, the lateral margins at first widely divergent, and afterwards nearly parallel; the gastric, cardiac, and branchial regions convex; the gastric region is posteriorly steeply inclined; anteriorly it slopes gently downward to the front, which is very prominent, nearly horizontal, smooth, and flat above, with the sides slightly arcuated and the apex subacute; the sides of the anterior face of the gastric prominence are sharply defined and usually somewhat granulated; the cardiac prominence has the form of a large, very distinctly defined granulated tubercle; on the branchial regions is a sharply defined oblique granulated ridge that extends from the postero-lateral angles of the carapace nearly

* Crustacea in Fauna del Regno Napoli, pl. vi. fig. 3 (1838).

to the base of the gastric prominence; the intervening parts of the carapace are nearly smooth; the antero-lateral, lateral, and posterior margins of the carapace are thin, sharp-edged, and somewhat obscurely crenulated. As in *Heterocrypta granulata*, there is a distinct more or less granulated ridge on the pterygostomian regions; the postabdomen in both sexes has six joints distinct. The short thick eyes fit closely into the orbits, which have a scarcely distinguishable closed fissure in their upper margins; the longitudinally-folded antennules are widely separated from the antennæ, whose basal joint occupies the inner orbital hiatus and whose short flagellum is scarcely visible from above in a dorsal view; the ischium joint of the outer maxillipedes is broad, nearly oblong, excavated at its distal end to receive the merus, which is nearly quadrate, not notched at its antero-internal angle, where it is articulated with the next joint; the exognath is narrow, and about reaches to the distal end of the merus. Chelipedes slender and somewhat elongated; merus or arm trigonous, with the three faces smooth, the margins with little-prominent crenulations or teeth, which are themselves minutely denticulated; wrist with three crenulated and minutely denticulated ridges; palm longer than the arm, trigonous, its upper surface smooth, the margins dentated, the teeth themselves granulated or denticulated and very small, except on the inner margin, where they average about ten in number; fingers small, acute at apices, and distinctly toothed on their inner margins. Ambulatory legs slender, smooth, with the joints compressed and usually unarmed; the merus joints of the first ambulatory legs, however, are sometimes minutely denticulated.

Colour (in spirit) yellowish white, pinkish, or slaty. Length of the largest male 5 lines (nearly 11 millim.); breadth nearly 6 lines (12 millim.); length of chelipede when extended as far as its conformation will allow $10\frac{1}{2}$ lines (22 millim.).

The description is taken from an adult male. Most of the females bear ova.

It is at once distinguished from its congeners, *Heterocrypta granulata*, Stimpson, and *H. macrobrachia*, Stimpson*, from the American seas, by the different form of the carapace, which in outline more nearly resembles that of certain species of *Cryptopodia* (e. g. *C. concava*).

It is certainly one of the most interesting species in the collection; and I have much pleasure in dedicating it to Baron Hermann-Maltzam, its discoverer.

* Ann. Lyc. Nat. Hist. New York, x. p. 105 (1871).

Lophozozymus (*Lophoxanthus*) *sexdentatus*, sp. n.
(Pl. XIII. fig. 2.)

In this pretty little species the carapace is less than one and a half times as broad as long; its dorsal surface is less convex than usual, and rather strongly lobulated on the postfrontal, gastric, and hepatic regions, and on the sides of the carapace behind the antero-lateral marginal teeth; the cervical suture and the depressions between the lobules are very distinct; the surface of the carapace (viewed under a lens) appears punctulated; the frontal margin projects somewhat more than is usual in the genus, and is straight and entire. The first (or outer orbital) tooth and the second tooth of the antero-lateral margins are not developed, the three posterior antero-lateral marginal teeth are prominent, triangulate, and acute, the front part of the antero-lateral margins and the subhepatic and pterygostomian regions, and the narrow epistome are more or less pitted and eroded. The segments of the post-abdomen are all separate and distinct in both sexes. The basal antennal joint reaches to the infero-lateral angles of the front. The outer maxillipedes are punctulated on their outer surface, the transverse merus joint being marked with two somewhat larger and deeper depressions. The chelipedes in the male are short, robust, and (in the specimens I have examined) of unequal size; arm or merus joint very short; carpus somewhat pitted above and on its outer surface, and with a spine on its inner surface; palm slightly convex on its upper and inner surface, and more or less pitted above and on its outer surface; fingers short, compressed, and nearly meeting along their inner edges when closed; the dactylus or mobile finger carinated above.

Ambulatory legs of moderate length, compressed, and carinated above; dactyli not carinated and closely pubescent. Coloration yellowish or slaty; chelipedes and ambulatory legs sometimes reddish, fingers brownish. Length of the largest example rather over $5\frac{1}{2}$ lines (11 millim.); breadth about $7\frac{1}{2}$ lines (16 millim.); the largest male is a trifle smaller.

All the specimens are males, except the largest, which differs in coloration, having the carapace marked with reddish blotches on a paler ground. In this example one chelipede only remains; in this the palm is more strongly pitted on its outer surface, and the fingers are pinkish.

M. Alph. Milne-Edwards has recently* established the genus *Lophoxanthus* for two species which apparently scarcely differ from *Lophozozymus*, except in the more depressed cara-

* Crust. in Mission Scientifique du Mexique, p. 256 (1873-80).

pace and the obsolescence of the first and second antero-lateral marginal teeth. To this genus (or subgenus, as I prefer to regard it) *L. sexdentatus* is to be referred. It differs from both the West-American species, *L. lamellipes*, Stim., and *L. bellus*, Stim., in the much more prominent front and teeth of the antero-lateral margins.

Prof. A. Milne-Edwards* has united with the *Lophozozymus* (*Xantho*) *radiatus* of M.-Edwards both the *Xantho lamelligera* and *Atergatis lateralis* of White. Yet more recently Dr. F. Hilgendorf† has referred all these species to the *Cancer dodone* of Herbst. It appears to me very doubtful, however, whether these identifications can be sustained. In White's specimens of *A. lateralis* in the British-Museum collection the chelipedes have the hands pitted and the wrist with a short keel or lobe (not two tubercles) on its inner surface, as in *L. dodone*, but there are no hairs on the antero-lateral marginal teeth, as described by Hilgendorf in that species. In *Lophozozymus lamelliger*, White, the carapace, as well as the chelipedes, is very distinctly granulated and pitted, the frontal lobes are sinuated, and the lobes of the antero-lateral margins granulated and very obscurely defined. The carpus of the chelipedes is rather bluntly cristate on its inner margin.

Xanthodes melanodactylus.

Xanthodes melanodactylus, A. M.-Edwards, Nouv. Arch. Mus. Hist. Nat. iv. p. 60, pl. xvii. figs. 1-3 (1868).

A large series is in the collection, all the specimens being of small size, the largest scarcely more than 3 lines (6.5 millim.) in length and 5 lines (11 millim.) in breadth; the anterior legs are unequally developed, ordinarily the right, but more rarely the left, being the larger; in the smaller chelipede the palm is slenderer and the fingers bent downwards, so that the lower margin of the smaller finger is not in a straight line with the inferior margin of the palm. The colour (of specimens preserved in spirit) is variable: sometimes the minute red punctulations on the carapace mentioned by M. A. Milne-Edwards are discernible, but in other examples they are quite obliterated; ordinarily the chelipedes are reddish and the fingers black or dark-coloured, with paler tips; but in others these limbs are pale-coloured, and in some the fingers are purplish. These variations seem to afford evidence that the coloration is of little value in this genus as a specific distinction.

* Nouv. Arch. Mus. Hist. Nat. ix. p. 206 (1873).

† Monatsb. der Akad. Wiss. Berlin, p. 789 (1878).

There is in the British-Museum collection a small specimen of this species from the Island of Ascension (*R. Trimen, Esq.*) in which carapace and legs are alike of a pale rose colour, and the fingers brownish, also specimens from Madeira (*Rev. R. Boog Watson*) in which the coloration is obliterated.

It may be of interest to add that there is in the series obtained by Baron Maltzam a female bearing ova whose length does not reach 2 lines (4 millim.).

X. rufopunctatus, A. M.-Edwards*, from Cape St. Vincent and Maio, is very briefly described, and I should be inclined to doubt its distinctness from *X. melanodactylus*; but not having examined the type, I do not venture to quote it as synonymous with the latter species.

X. eriphoides, A. M.-Edwards†, also obtained from Cape St. Vincent, is at once distinguished by the strong spiniform tubercles of the carapace, chelipedes, and legs. This species is still a desideratum in the collection of the British Museum.

Xantho pilipes ?

? *Xantho pilipes*, A. M.-Edwards, Ann. Soc. Entom. France, vii. p. 268 (1867).

There are in the collection numerous specimens of a species of *Xantho*, which I refer here with some hésitation, as Milne-Edwards's diagnosis is in few words. According to the distinguished French naturalist *X. pilipes* is nearly allied to *X. rivulosus*, but is distinguished by its narrower and less convex carapace, the much deeper depressions separating the branchial from the hepatic regions, the well-defined triangular anterolateral marginal teeth, which are four in number, the slight prominence of the external orbital angle, and in the inferior and lateral regions of the carapace being covered with hairs. Breadth of carapace 40 millim., length 34 millim. In all these particulars the specimens before me agree with *X. pilipes*.

The front in these specimens, as in most species of the genus, is divided by a median notch into two broad and truncated lobes. On the postfrontal region and on the front of the gastric region are slightly marked transverse elevations. The male postabdomen is five-jointed; the third to fifth segments coalescent; the anterior legs (in the adult male) are very robust; merus or arm short, smooth; carpus or wrist with a small tooth on its inner margin; palm short, robust, smooth on its outer and inner surfaces, in all except the largest examples obscurely ridged on its upper margin;

* Rev. et Mag. Zool. (ser. 2), xxi. p. 409 (1869).

† Arch. Mus. H. N. iv. p. 58, pl. xvi. figs. 10-14 (1868).

fingers black or pale brown, with lighter tips. Ambulatory legs short, compressed, the hairs most dense on the merus joints. In spirit-specimens the chelipedes are often orange or reddish, and the carapace with more or less trace of reddish coloration upon a paler ground. None of the specimens before me are so large as Milne-Edwards's type, the largest not 7 lines (14 millim.) in length, and a little under 10 lines (20 millim.) in breadth.

X. pilipes has been hitherto a desideratum in the collection of the British Museum.

X. parvulus (Fabr.), Milne-Edwards* (a species found in the West Indies and on the coast of Brazil, and which, according to Dana, occurs at the Cape-Verds), has an extremely strong tooth at the base of the mobile finger, which does not exist in the specimens I refer to *X. pilipes*.

In *X. minor*, Dana†, from Madeira and the Cape-Verds, the upper margin of the hand is deeply sulcated; and in specimens I refer with some hesitation to this species in the Museum collection from Madeira (*Rev. R. B. Watson*), the chelipedes are much slenderer, hand and carpus more rugose and tuberculated.

Leptodius punctatus, sp. n. (Pl. XIII. fig. 3.)

Carapace moderately convex, about one and a half times as broad as long, the convexities on the anterior part of its upper surface prominent and separated by strongly-marked and rather wide depressions; these elevations are pitted with scattered punctuations; but the intervening depressions and the flat posterior and postero-lateral regions of the carapace are smooth. Front bisinuated and with a median incision, thus divided into four rounded and not prominent lobes, the frontal margin and the upper orbital margins somewhat thickened. Antero-lateral margins of the carapace with the four posterior teeth distinct and somewhat tuberculiform; the tooth at the exterior orbital angle obsolete. Postabdomen of the male narrow, composed of only five distinct segments; terminal segment triangulate. Outer maxillipedes having the merus joint transverse and marked with a circular pit on its outer surface. Anterior legs or chelipedes (in the two specimens examined) robust; merus or arm short; carpus or wrist pitted on its upper and outer surfaces, smooth on its inner surface, with a blunt tooth at its antero-internal angle; palm pitted above and on the upper part of its outer surface, smooth

* Hist. Nat. Crust. i. p. 395 (1834).

† Cr. U.S. Expl. Exp. xiii. p. 169, pl. viii. fig. 7 (1852).

below and on its inner surface; fingers rather obscurely toothed on their inner margins, of a deep black colour, the coloration not extending along the inner and outer surfaces of the palm; the mobile finger is longitudinally channelled above, but without spinules or tubercles near its base. Ambulatory legs short, compressed, with only a few hairs on the upper margins of the merus joints; terminal joints clothed with a short dense pubescence. Colour in the typical example coppery red, paler below. Length of carapace about 7 lines (15 millim.), greatest breadth nearly 11 lines (23 millim.).

The single specimen in the collection is an adult male. In the pitted carapace and chelipedes, and in the strongly defined inequalities of the carapace, this species more nearly resembles *Xanthodius* than *Leptodius*; but it presents no traces of the palatal ridges which are characteristic of the former genus and, indeed, constitute its sole claim to generic distinctness. As these ridges in *Xanthodius* are sometimes imperfectly defined, it may be necessary to unite the two genera, as has been done by Prof. A. Milne-Edwards. As compared with the West-Indian *Xanthodius americanus*, Saussure, *Leptodius punctatus* has the carapace somewhat less convex toward the frontal and antero-lateral margins, the lobulations of the carapace less prominent and separated by wider depressions. In both specimens of *Leptodius punctatus* examined the right chelipede is but little larger than the left.

The differences, however, between the West-Indian and African forms are so slight that, but for the single character of the absence of the palatal ridges, I should have considered *L. punctatus* a mere variety of *X. americanus*. *L. punctatus* further resembles *Xanthodius*, and differs from most species of *Leptodius*, in that the black coloration of the fingers does not extend along the inner or outer surface of the hands. There is in the British-Museum collection a male, preserved dry, from the west coast of Africa, in which the frontal lobes are obsolete*.

* *Leptodius Macandreae*, sp. n. (Pl. XIII. fig. 4.)

There is in the collection of the British Museum a single specimen of a species of *Leptodius* from the Canaries, which is very distinct from the preceding and from all others that I have examined. It may be briefly diagnosed as follows:—Carapace flat above, with scarcely any traces of surface prominences or depressions; slight sulci, however, are observable, which originate at the bases of the third and fourth antero-lateral marginal teeth. Frontal margin divided by a median notch into two broad truncated lobes, from which the little prominent internal orbital angles are separated by a notch; the teeth at the exterior orbital angles and the first pair of antero-lateral-marginal teeth are obsolete, the three posterior teeth of the antero-lateral margins distinct. Chelipedes robust; carpus

Pilumnus verrucosipes. (Pl. XIII. fig. 5.)

Pilumnus verrucosipes, Stimpson, Proc. Ac. Nat. Sci. Phil. p. 38 (1858).

Four specimens in the collection agree in all particulars with Simpson's diagnosis, to which the following may be added:—The front is rather prominent, its median notch very small; the first or exterior orbital tooth is small; the verrucosities of the chelipedes and ambulatory legs are prominent and tuberculiform; the outer surface of the larger chelipede (which may be either the right or the left) is nearly naked, and the granulations with which it is covered become obsolete toward the inferior margin. The oblique ridges on the inner surface of the palate do not quite reach to the anterior margin of the buccal area. Orbital margin with a wide inner hiatus and a very narrow fissure near the outer orbital tooth, near to which, on the upper orbital margin, is sometimes a second very small tooth. Colour yellowish or olive-brown. Length of the largest example 3 lines (nearly 6 millim.), breadth a little over 4 lines (9 millim.).

This species was hitherto unrepresented in the British-Museum collection; and its acquisition is of interest, since the type was obtained by the United-States expedition at Simon's Bay, Cape of Good Hope.

A *Pilumnus* (*P. africanus*) has been described by Prof. A. Milne-Edwards* from Goree and Angola, which is in all respects very distinct from *P. verrucosipes*, and is allied in many of its characters to *P. hirtellus*. To it I refer specimens without locality in the Museum collection.

with two obscure teeth on its inner surface; palm obscurely ridged and sulcated along the upper margin; fingers somewhat compressed, distinctly toothed near the base, and ridged above; pale coloured, the lower fingers only being excavated at tips; those of the larger chelipede widely gaping; ambulatory legs compressed.

The specimen, which is preserved dry, has faint reddish markings on a pale ground. Length of carapace little more than 6 lines (11 millim.), breadth about 8 lines (17 millim.). The smooth carapace, together with the obsolescence of the exterior orbital and first antero-lateral-marginal teeth, seems to distinguish this species, which was presented to the British Museum by the late R. MacAndrew, Esq.

It bears a curious resemblance to *Lophozozymus 6-dentatus*, from which not only the excavated finger-tips but the much broader, smoother carapace, with less prominent front and smaller antero-lateral teeth, at once distinguish it. It is very nearly allied to *Leptodius dispar*, Stimpson, a Cuban species, in all particulars except that in *L. dispar* no trace exists of the third antero-lateral tooth, and the chelipedes are described as "naked, smooth, and polished; fingers a little more than one half as long as the palm, scarcely gaping, and but little excavated at the tips."

* Ann. Soc. Entom. France (ser. 4), vii. p. 280 (1867).

Neptunus (Amphitrite) inequalis, sp. n.
(Pl. XIII. fig. 6.)

Carapace rather convex, closely pubescent and granulated; the granules disposed in series upon the more elevated parts of the gastric, cardiac, and branchial regions; on the gastric region the granulated prominences are disposed in a cruciform figure, behind which are two closely approximated tubercles in the median line; two similar submedian prominences exist on the cardiac region, and three oblique granulated elevations on each branchial region; from the long lateral epibranchial spines a line of granulations extends on each side to the hepatic region, where it is bifurcated. Front with six lobes, of which the two median are small, the next on each side prominent and triangulate, and the outer (or inner orbital lobe) broadly rounded. The antero-lateral marginal teeth are spiniform and acute; the ninth (or lateral epibranchial) tooth very long, in the largest individual about one third as long as the greatest width of the carapace. No spines at the postero-lateral angles of the carapace. Postabdomen (in the male) subtriangulate, not T-shaped, as in *Callinectes*. Anterior legs slender and somewhat elongated; arm or merus with four or five spines on its anterior margin, and one at the distal extremity of its posterior margin; wrist or carpus with a strong spine on its inner and outer surfaces; palm slender and elongated, with two spines on its upper margin (one just above the articulation of the dactylus, and the other a short distance behind it), and with a third spine just above the articulation with the wrist. Ambulatory legs slender; fifth pair having the merus joint unarmed, and the terminal joint ovate, ciliated, and rounded at the distal end. Colour (of spirit-specimens) light yellowish, inclining to pink; fingers variegated with reddish or purplish. Length of largest individual (a female with ova) about 7 lines (15 millim.), breadth to base of lateral epibranchial spines $11\frac{1}{2}$ lines (24 millim.). Length of chelipede, when extended, 1 inch $6\frac{1}{2}$ lines (39 millim.).

The description is taken from the largest example; three other smaller specimens are in the collection, two of which are males. In the smaller specimens the elevations of the carapace are less distinctly marked, the two anterior gastric prominences being indeed obsolete: the teeth of the antero-lateral margins are less spiniform; but the full number are developed even in the smallest example, which measures scarcely 3 lines (6 millim.) in length.

In many particulars this species is nearly allied to the West-Indian *Neptunus Gibbesii*, Stimpson, but may be dis-

tinguished by the greater prominence of the submedian frontal teeth, more convex and tuberculated carapace, with longer lateral epibranchial spines, &c. From *Neptunus marginatus*, A. M.-Edwards, which inhabits the Gaboon coast, it is at once distinguished by the tuberculated carapace and the existence of an additional spine on the upper margin of the palm; and from *N. vocans*, A. M.-Edwards, from the Cape-Verd Islands, by the form of the frontal teeth and the absence of a spine at the postero-lateral angles of the carapace.

N. anceps, Saussure*, of which there is a specimen from Martinique in the Museum, has the carapace much less tuberculated and differently shaped antero-lateral marginal teeth, &c.

Thalamita integra, var. *africana*, n.

This designation is proposed for several *Thalamita* in the collection, which scarcely differ from typical specimens of *Thalamita integra*, except in having the lateral lobes of the front shorter than the median lobes. As is usual in *T. integra*, the fourth lateral marginal spine is rudimentary, the basal antennal joint is armed with a smooth and entire crest, and the penultimate joint of the fifth leg bears traces of very minute denticulations. The carapace is somewhat pubescent; the armature of the chelipedes closely resembles that of the typical *T. integra*. The fact of *Thalamita integra* being an Oriental species and not occurring (as far as is known) on the west African coasts, renders it possible that the specimens from Goree Island may belong to a distinct species; but a larger series is required to determine the point with certainty.

There are in the British Museum two small specimens from the Canaries (*R. MacAndrew, Esq.*) which belong to the new variety.

Goniosoma Millerii.

Goniosoma Millerii, A. M.-Edwards, Nouv. Arch. Mus. Hist. Nat. iv. p. 54, pl. xviii. figs. 1-3 (1869).

Here are referred two small examples, males; the larger measures little more than 5 lines (11 millim.) in length, and about 7 lines (15 millim.) in breadth. The small denticles between the larger antero-lateral teeth are perfectly distinguishable, although very small; the frontal teeth, although broad and obtuse, are scarcely as much truncated as in the figure above cited. In the smaller example, length only $3\frac{1}{2}$ lines (little over 7 millim.), the denticles of the antero-

* Mém. Soc. Phys. et Hist. Nat. Genève, xiv, p. 434, pl. ii. fig. 11 (1858).

lateral margins are on one side obsolete and on the other discernible only by a lens of considerable power; the frontal teeth are less regular, and separated by somewhat shallower incisions; so that, had the larger specimen not been available for comparison, the identity of the smaller with Milne-Edwards's species might well have been questioned.

This is a very interesting acquisition, the species having been hitherto a desideratum in the Museum collection.

Its near affinity with the Oriental *G. erythroductylum*, noted by Milne-Edwards, is unquestionable; but in adult individuals of that species there are only two rudimentary denticles in the interspaces between the three anterior teeth of the antero-lateral margins; moreover, in the specimens I have seen of *G. erythroductylum*, the carapace is smooth and naked, whereas in *G. Millerii* it is clothed by a short pubescence.

Since the above was written a larger female has been received from Baron Hermann-Maltzam, from Goree Bay. Length nearly 10 lines (21 millim.), breadth about 1 inch 2 lines (30 millim.).

Portunus corrugatus (Pennant).

Here are referred several specimens in the collection; they are of the typical form, with distinctly defined frontal lobes. The wide Oriental range of this common European species I have already noted*; and the fact of its occurrence in the Atlantic region, as far southward on the west coast of Africa as Senegambia, is not without interest.

Portunus pusillus, Leach.

Three examples, a male and two females, are in the collection, which agree in all particulars with Mediterranean specimens.

There are in the British Museum examples from the Canaries (*R. MacAndrew, Esq.*).

Portunus pusillus has much affinity with *Portunus africanus* (A. M.-Edw.) and *P. nasutus* (Latreille), and it is indeed difficult to cite any certain differences by which these species may be distinguished from *Portunus*.

P. pusillus has evidently a wide geographical range, being found on the British coasts as far north as the Shetlands, from which locality there are specimens in the British-Museum collection.

It is one of the British species recently mentioned by Mr.

* "On a Collection of Crustacea from the Corean and Japanese Seas," Proc. Zool. Soc. 1879, p. 33.

Kirk as occurring in the New-Zealand seas; but I am inclined to think the New-Zealand species distinct, since Mr. Kirk mentions the existence of a "prominent spine" on the anterior margin of the hand in his specimens: this I have never observed in the true *P. pusillus*, which has the distal end of the anterior margin acute or armed with a very small spinule.

Atelecyclus rotundatus, Olivi.

Several specimens of this common Mediterranean species are in the collection. Length of the largest 11 lines (23 millim.), breadth a little over 1 inch 1 line (28 millim.); the others are all much smaller.

[To be continued.]

XXII.—*Remarks upon Mr. Wood-Mason's Paper "On the Discrimination of the Sexes in the Genus Paludina."* By
EDGAR A. SMITH.

MR. WOOD-MASON'S object is to show that the sexes of *Paludina* are distinguishable by differences both in the shells and animals. This fact, I need scarcely remind the readers of this journal, has been known for nearly two hundred years. Lister, in 1695*, gave a very fair anatomical description of the animal, demonstrating (p. 46) the bisexuality of the genus and the characters of both male and female.

He says, in reference to the distinguishing external features, "si tamen nota aliqua *externa*, qua mas a foemina primo intuitu discerni possit, desideretur, scire licet mares fere *minores* esse, deinde, in maribus *dextrum cornu* (tab. 2. fig. 1, *f*) *sinistro duplo latius esse, apiceq. obtuso desinere.*" On turning to the above-quoted figure we find it thus described:—"Dextrum maris cornu obtusum, in quo penis exitus est."

The latter discovery has since received confirmation from Cuvier †, Moquin-Tandon ‡, and others.

Supposing a marked difference in the size of the adult shells generally prevails in the sexes of *Paludina*, I fail to perceive how a conchologist, judging from the shells alone, can know which, in any series he may have before him, have contained males and which females. In any large number of a species

* 'Exercitatio anatomica altera, in qua maxime agitur de Buccinis fluviatilibus et marinis' (12mo, London, 1695).

† Ann. du Mus. 1808, p. 170; also Mémoires pour serv. à l'Hist. des Mollusques, 1817.

‡ Mollusques terr. et fluv. de France, 1855, vol. ii. pp. 530-537.